



TAURUS

OPERATOR'S MANUAL

PRELIMINARY

moogTM

MUSIC INC.

the first sound in synthesizers

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Preliminary

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1. INTRODUCTION

The MoogTM Taurus is a foot-controlled pedal synthesizer combining the features of a synthesizer--good sound and versatility--with foot controlled sound modifiers and presets.

This versatile musical instrument offers the capability of producing traditional or new sounds, instantly selectable from the foot-controlled presets.

One of these presets is fully programmable so that the player may set up a "sound" and get to it instantly.

To provide maximum protection, the unit is assembled in a rugged wood and metal housing.

2. BASIC OPERATING PROCEDURES

A. First Time Setup

1. 115/230 VOLTAGE SELECTOR switch

(Location - inset rear panel)

Set to match line voltage being used using a small flat bladed screwdriver.

2. POWER CABLE

(Location - inset rear panel)

Plug in.

3. AUDIO output jack

(Location - inset rear panel)

Connect to power amp input.

4. POWER switch

(Location - inset rear panel)

Switch "On."

5. OUTPUT LEVEL control

(Location - inset rear panel)

Set to match output signal level to the particular power amp and speaker being used so that loudest desired signal occurs with LOUDNESS foot-slider all the way up.

Use Fig. 1 for location of controls for the remainder of this section.

6. Check operation of three fixed presets by depressing the relevant preset foot-buttons and playing the instrument. Turn OCTAVE, GLIDE, and DECAY foot-buttons off (lights OFF).

7. Check operation of OCTAVE foot-button--light ON is B' range, light OFF is 16' range.
- B. Check operation of DECAY foot-button using TAURUS preset: long decay after note release will result when light is ON: no decay is present after note release when light is OFF.
9. Check operation of GLIDE foot-button using TAURUS preset. Set GLIDE slider in VARIABLE control box to mid-position--note pitch glide effect when playing different notes in succession.
10. Check operation of LOUDNESS and FILTER foot-sliders using TAURUS preset.

B. General Operation

1. Place the instrument on a flat smooth surface.
2. The Taurus tone sources are very pitch stable and will need to be tuned only if adjustments are required to tune to other instruments. Turn instrument ON and fine tune instrument using the TUNE control in the VARIABLE control box (use TUBA preset).
3. Set desired beat rate of second oscillator using the BEAT control in VARIABLE control box (use TAURUS preset).
4. Set desired amount of glide effect using GLIDE slider in VARIABLE control box.
5. Set up VARIABLE preset to the desired sound and octave using the PROGRAMMED PRESET controls in VARIABLE control box. For details, see Section 4, "Setting up the Variable Preset."

6. Select desired preset using preset foot-button.
7. GLIDE, DECAY, and OCTAVE selections may be switched using the relevant foot-buttons.
8. FILTER and LOUDNESS may be varied using foot-sliders.

3. INSTRUMENT DESCRIPTION

Figure 2 shows the basic elements of the Taurus Synthesizer.

All of the basic functions of this synthesizer are programmable--that is, values of the various parameters that are used to control the details of a sound are determined either by the internally fixed values (for the three fixed presets), or set by the player accessible controls (for the VARIABLE preset). In normal usage the VARIABLE preset is set up prior to performance using the VARIABLE controls under the access window. During actual performance, the player selects one of the four presets instantly by depressing one of the four preset foot-buttons. These four presets are mutually exclusive, that is, only one preset may be ON at any one time.

The basic tone sources are two voltage-controlled oscillators (A and B). Two basic pitch controls are used for fine tuning the instrument. First, the TUNE control is used to set the pitch of both oscillators to the desired reference, such as another instrument being used simultaneously. The BEAT control is used to make fine adjustments in the relative pitch of the two tone oscillators (by modifying the "B" tone source pitch). In addition to these basic tuning controls, the "B" tone oscillator pitch in the variable preset mode may be varied over a greater than one octave range by adjusting the OSC B FREQ control. The relative pitches of the two tone sources are internally set for the three fixed presets.

The entire instrument may be shifted either up or down one octave by use of the OCTAVE foot-button. As the OCTAVE foot-button is successively depressed the instrument tuning changes by one octave; an indicator light shows that the instrument tuning is in high range. For the three fixed presets this OCTAVE button switches the instrument between the 16' and 8' ranges. When the instrument is in the VARIABLE mode a manual slide switch

in the VARIABLE control box labelled OCTAVE may be used to select three pitch ranges, labelled LO-MED-HI. These three positions correspond to a 16' or 8' range for the LO position, an 8' or 4' range for the MED position, and a 4' or 2' range for the HI position. The "B" oscillator range extends to 1' with the OSC B FREQ control all the way up.

The instantaneous pitch of the instrument is controlled not only by the octave and fine tuning controls, but also by a glide control and glide foot-button. The glide effect is a smooth transition in pitch between successive notes. The GLIDE foot-button operates in a manner similar to the OCTAVE foot-button in that the GLIDE effect can be alternately turned ON and OFF, the ON state indicated by the GLIDE light being ON. The amount of glide effect is determined by the GLIDE slider in the VARIABLE control box. The player may thus set up the amount of desired glide effect using the slider and then use the GLIDE foot-button to switch the effect in or out.

The two tone sources are combined in different amounts in the mixer. In the three fixed presets the amounts are internally set, while in the variable mode the relative amounts of the "A" and "B" tone sources appearing in the final output is determined by the B-MIX-A control in the VARIABLE control box.

The output of the mixer is applied to the voltage controlled filter which may be used to provide either dynamic or fixed timbre modification. Whenever a note is depressed a filter contour signal is generated. This filter control signal successively opens and closes the filter. The amount of opening and closing the filter is determined by the CONTOUR AMOUNT slider. The rate at which the filter is opened is determined by the CONTOUR ATTACK control slider, while the rate at which the filter is closed is determined by the CONTOUR DECAY slider. These contour controls determine the characteristics of the dynamic aspect of the filter function.

The effect of the filter is determined by the settings of the contour controls and by two other controls--namely CUTOFF and EMPHASIS. The cutoff frequency is the filter characteristic which is "moved" by the contour signal. The initial cutoff frequency is determined by the FILTER foot-slider and by internally preset values for the three fixed presets. For the VARIABLE preset, this initial filter cutoff frequency is determined by the FILTER foot-slider and by the CUTOFF control in the VARIABLE control box. For example, using the VARIABLE preset with the CONTOUR AMOUNT control set all the way down, the tone color may be changed by either the FILTER foot-slider or the CUTOFF slider, but the tone color is not changed dynamically.

The EMPHASIS control varies the amount of peaking of the filter. That is, the intensity of the frequency components of the tone generators which lie near the filter cutoff frequency are emphasized to a degree determined by the EMPHASIS control.

The output signal from the voltage controlled filter is applied to the voltage-controlled amplifier (VCA). The VCA serves the function of "turning on and turning off" the sound. This articulation of the signal is caused by the VCA contour generator. The rate at which the sound is "turned on" is called the attack time. This attack time is internally set for the three fixed presets, and is set by the ATTACK control in the VARIABLE control box for the VARIABLE preset. The sustained loudness of a preset is called the SUSTAIN LEVEL. This SUSTAIN LEVEL is determined by an internally preset value for the three fixed presets, and by the SUSTAIN LEVEL control for the VARIABLE preset. In addition, the overall loudness is determined by the LOUDNESS foot-slider. The manner in which the sound dies out or decays is determined by two functions. If the DECAY light is ON, the sound dies out at a rate determined by the DECAY control in the VARIABLE

control box for the VARIABLE preset. If the DECAY light is OFF, the sound dies out immediately when the note is released (no decay).

The output of the VCA is applied to the OUTPUT LEVEL rotary control on the inset rear panel. The OUTPUT LEVEL control is used to match the signal level of the Taurus to the amplifier. Generally, this OUTPUT LEVEL control will be set so that the maximum desired loudness for any preset is achieved when both the LOUDNESS and the FILTER foot-sliders are in their uppermost positions. When using the TAURUS with a bass amplifier or similar musical instrument amplifier, plug the TAURUS output into a high level amplifier input, and set the amplifier volume control one-third to one-half of the way up. Then set the OUTPUT LEVEL control on the instrument's rear panel for the desired volume range.

The Taurus may be operated using either a 115 or 230 volt line voltage.

4. SETTING UP THE VARIABLE PRESET

The VARIABLE preset is programmed using ten slide controls and one selector switch located in the VARIABLE control box.

One basic procedure for setting up the VARIABLE preset is to proceed with the sound synthesis in the following manner.

1. Set the controls as follows:

(a) OCTAVE	MED
(b) B-MIX-A	CENTER
(c) OSC B FREQ	CENTER
(d) ATTACK	DOWN
(e) SUSTAIN LEVEL	UP
(f) DECAY	DOWN
(g) CUTOFF	UP
(h) EMPHASIS	DOWN
(i) CONTOUR AMOUNT	DOWN
(j) CONTOUR ATTACK	DOWN
(k) CONTOUR DECAY	UP

2. Choose the desired octave range by setting the OCTAVE switch to LO (16'-8'), or MED (8'-4'), or HI (4'-2').

(The following steps should be done while holding down a note and listening to the sound.)

3. Adjust the relative pitch of the two tone sources by adjusting the OSC B FREQ slider; with the slider all the way down the "B" oscillator will be about one half step lower than the "A" oscillator, while with the slider all the way up, the "B" oscillator

will be about one octave plus a half step above the "A" oscillator. (If the "B" oscillator is not used as determined in the next step, then this "B" tuning is not necessary.)

4. Select the relative amount of the two oscillators using the B-MIX-A slider.
5. Select the desired envelope shape using the three sliders subtitled LOUDNESS. With the ATTACK slider all the way down a rapid attack is produced, while with the slider all the way up, a slow attack is produced. The SUSTAIN LEVEL control is used to balance the loudness level of the VARIABLE preset while the note is being held and should be left in the uppermost position until several later adjustments have been completed, at which time a final adjustment of this ATTACK slider may be desired. The DECAY slider is used to determine the rate at which a sound dies away when the pedal is released if the DECAY foot switch is on. With the DECAY slider all the way down, a very short decay results, while long decays occur with the slider up.
6. Adjust the voltage controlled filter sliders subtitled, FILTER, to achieve the desired "timbre." First the CUTOFF and EMPHASIS controls should be adjusted to achieve the basic desired tone color. At this point there will be no dynamic timbre changes. Dynamic timbre changes are accomplished via the CONTOUR AMOUNT, the CONTOUR ATTACK, and the CONTOUR DECAY. Dynamic filtering is initiated when a note is depressed. In order to observe this dynamic filtering, a note should be repeatedly depressed

and released. After the cutoff frequency has been adjusted, put the CONTOUR AMOUNT slider all the way up, depress a note, and observe that the filter opens up and then closes down. (The DECAY slider may need to be in the UP position to observe this fact.) Set the three contour adjustments to achieve the desired amount of dynamic filter control, the desired attack of the dynamic filtering, and the desired decay of the dynamic filter.

7. Adjust the SUSTAIN LEVEL to achieve relative balance of the VARIABLE preset with the other presets.

5. SPECIFICATIONS

1. Control Complement

A. Presets (4)	Momentary foot-button with electronic interlock (1 variable and 3 fixed)
B. Glide (On-Off)	Momentary foot-button, toggle (alternate) On-Off
C. Glide (Amount)	Slider in Program Box
D. Decay (On-Off)	Momentary foot-button, toggle On-Off
E. Octave (High-Low)	Momentary foot-button, toggle High-Low
F. Filter (Brightness)	Foot Slider
G. Loudness	Foot Slider
H. Fine Tune ($\pm 1\text{-}1/2$ semitones)	Rotary Pot in Program Box
I. Beat Rate ($\pm 2\%$)	Rotary Pot in Program Box
J. Output Level Adjust	Rotary Pot on Rear Panel
K. Programmable Preset Controls	
1. Octave (1-2-3)	3 Position Slide Switch
2. Oscillator #1-#2 Mix	Slider
3. Oscillator #2 Frequency	Slider
4. Loudness Attack	Slider
5. Loudness Decay	Slider
6. Filter Attack	Slider
7. Filter Decay	Slider
8. Filter Contour Amount	Slider
9. Emphasis	Slider
10. Filter Cutoff Frequency (brightness)	Slider
11. Loudness	Slider

- | | |
|----------------------------------|---------------------------|
| L. Power (On-Off) | Rocker switch, rear panel |
| M. 115/230 Line Voltage Selector | Slide switch, rear panel |

2. Functional Specification

- | | |
|----------------------------------|--|
| A. Power Requirements: | 95-130/190-260 VAC, 50-60 Hz,
9VA |
| B. Size: | 24-3/16 l, X 19-7/8 w, X 8-5/16 h |
| C. Weight: | 26 lbs. |
| D. Oscillators | |
| 1. Range: A. | 16' - 2' |
| B. | 16' - 1' (+10%, -10%) |
| 2. Stability: | ±0.1% short term (5 min. warm-up)
±0.3% long term |
| 3. Waveshape: | sawtooth (both osc.) |
| 4. Pitch accuracy: | error less than ±2 cents (0.12%) |
| 5. Glide rate: | 0 - 0.5 sec time constant |
| 6. Fine tune range: | ±8% |
| E. Filter | |
| 1. Type: | 24 db/oct, VCF |
| 2. Emphasis (peaking) | flat to oscillation |
| 3. Foot slider control range | 3 octaves |
| 4. Variable preset control range | 7 octaves |
| 5. Contour control range | 7 octaves |
| F. Filter Contour | |
| 1. Attack time: | 5 - 56 msec. (1 time-constant) |
| 2. Decay time: | 50 msec - 2.8 sec. (1 time-constant) |
| G. Loudness Contour | |
| 1. Attack time: | 5 - 560 msec. (1 time-constant) |
| 2. Decay time: | 50 msec. - 2.8 sec. (1 time-constant) |
| H. Power Supply: | ±15 VDC, +5 VDC |

6. MAINTENANCE AND SERVICE

In general, the Taurus foot-pedal synthesizer should require very little maintenance. The Taurus electronics have been designed with a fixed musical scale and, unlike most other synthesizers, it cannot be adjusted externally or internally. All necessary tuning controls are accessible to the player and if for some reason the instrument cannot be tuned properly, an internal defect is indicated. There are no user serviceable parts inside, except for fuses which will not blow unless there are internal problems.

Since there are no user serviceable parts inside, the unit should be returned to the factory in its original shipping carton, or referred to qualified personnel for any service. Service information is available from the factory on request to qualified personnel.

Any cleaning of the unit should be done with warm soapy water using a damp cloth. Care should be exercised to prevent any cleaning solution from entering the interior of the instrument. If any of the plastic foot-pedal caps should break, replacement caps are available from the factory.

As noted previously in this manual, the power line voltage selector switch located on the rear inset panel must be in the proper position. Operation of this unit from a 230 volt line with the voltage selector switch in the 115 position may cause damage requiring service.

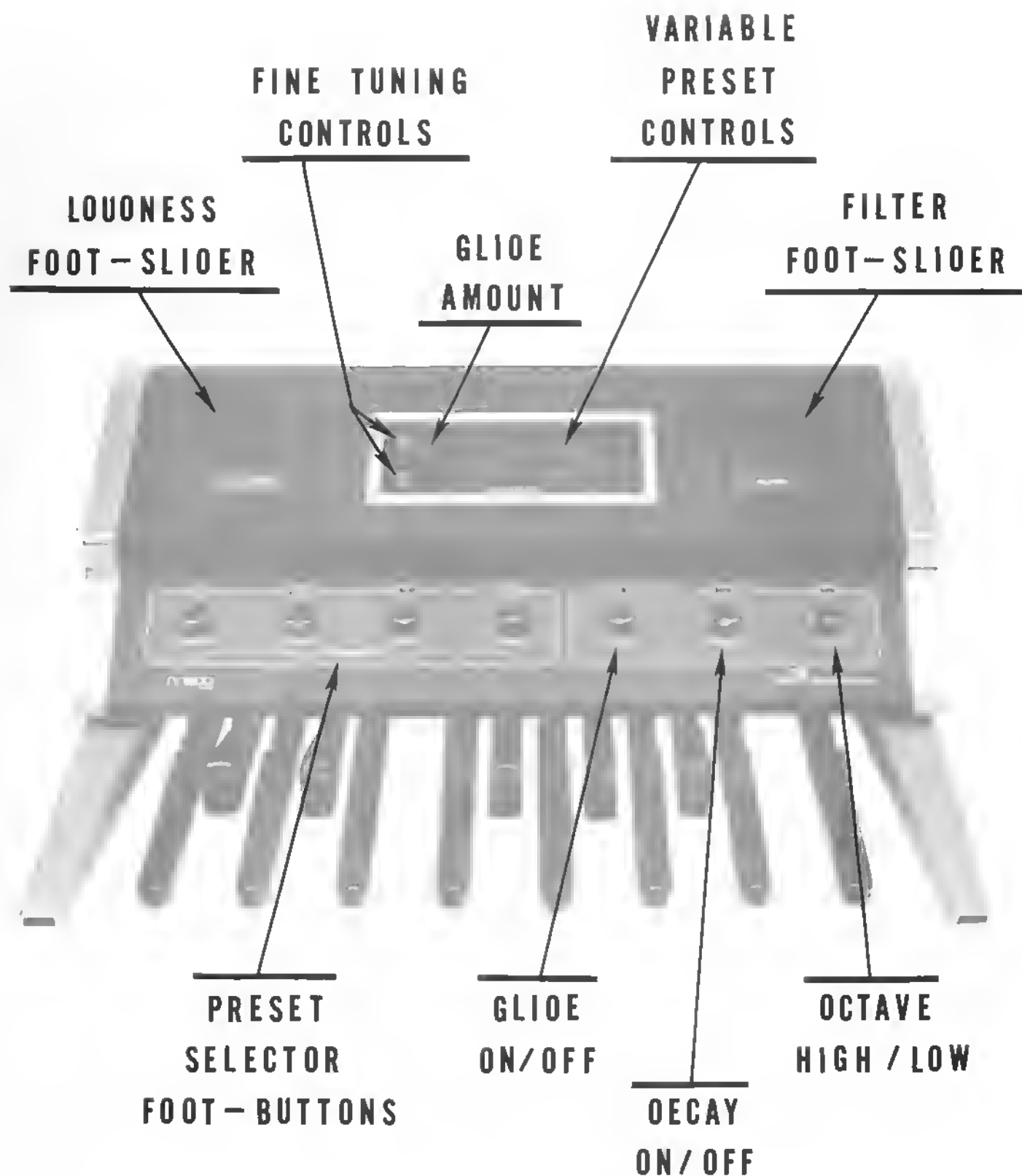


FIG. 1

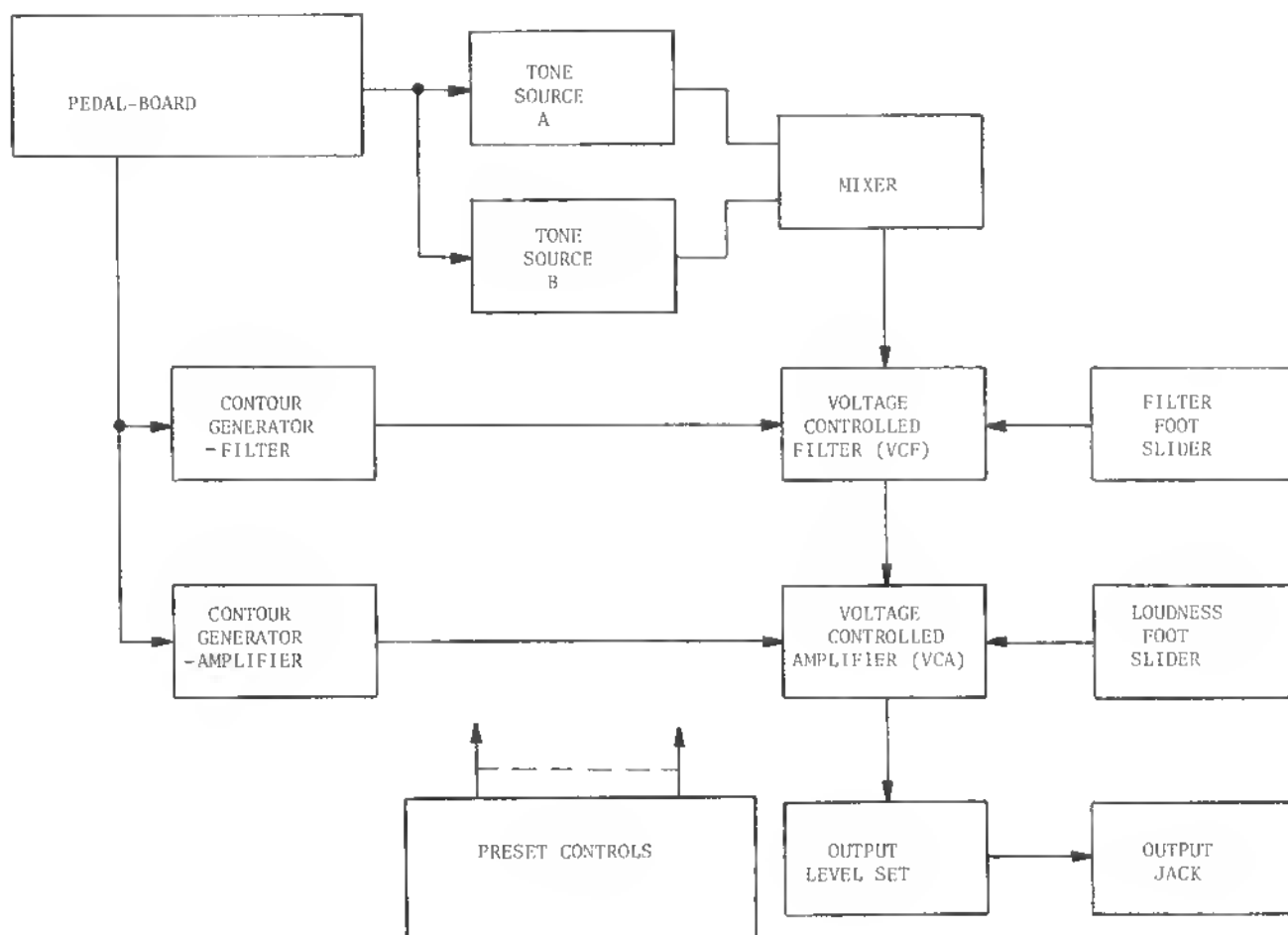
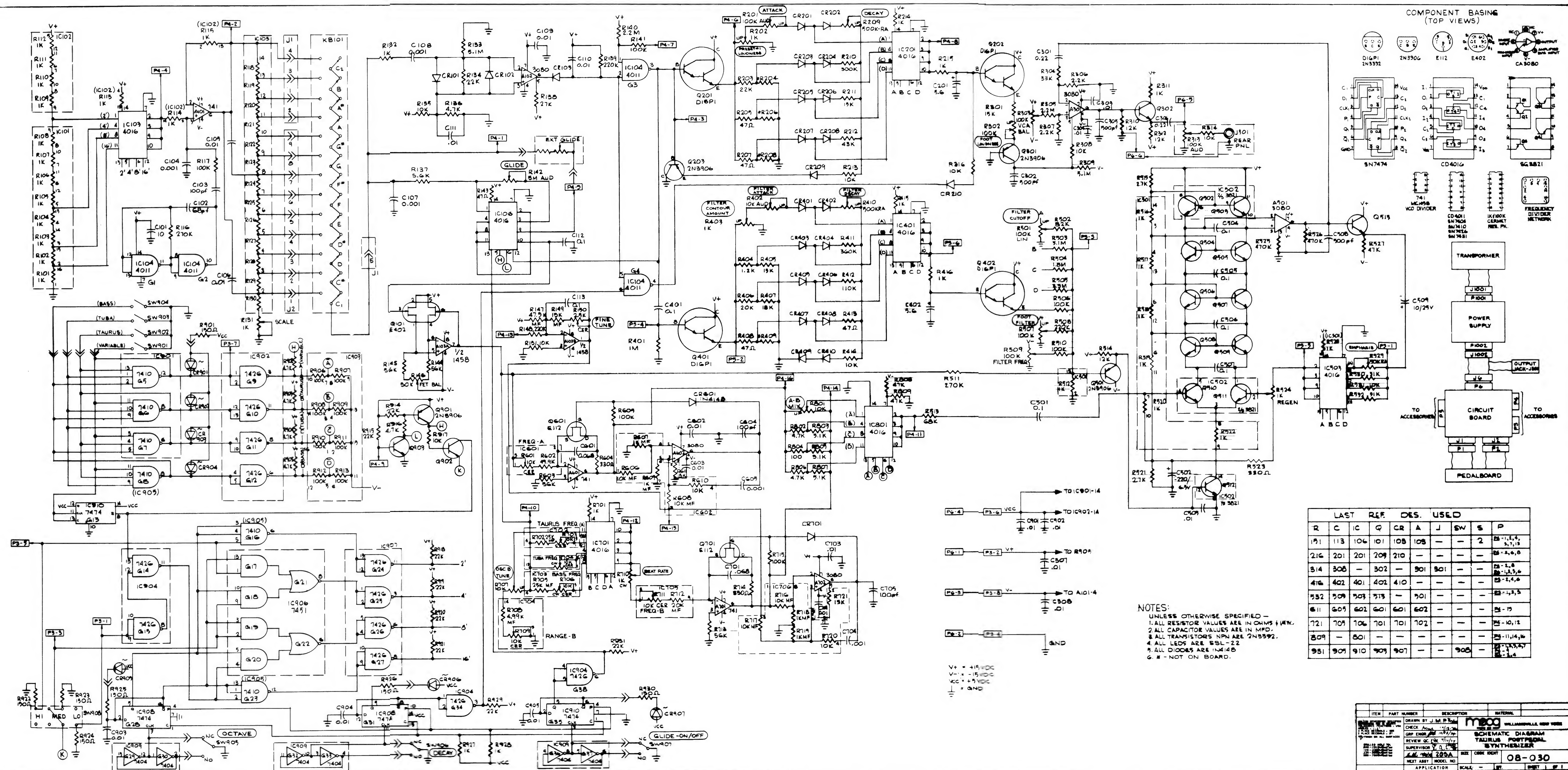


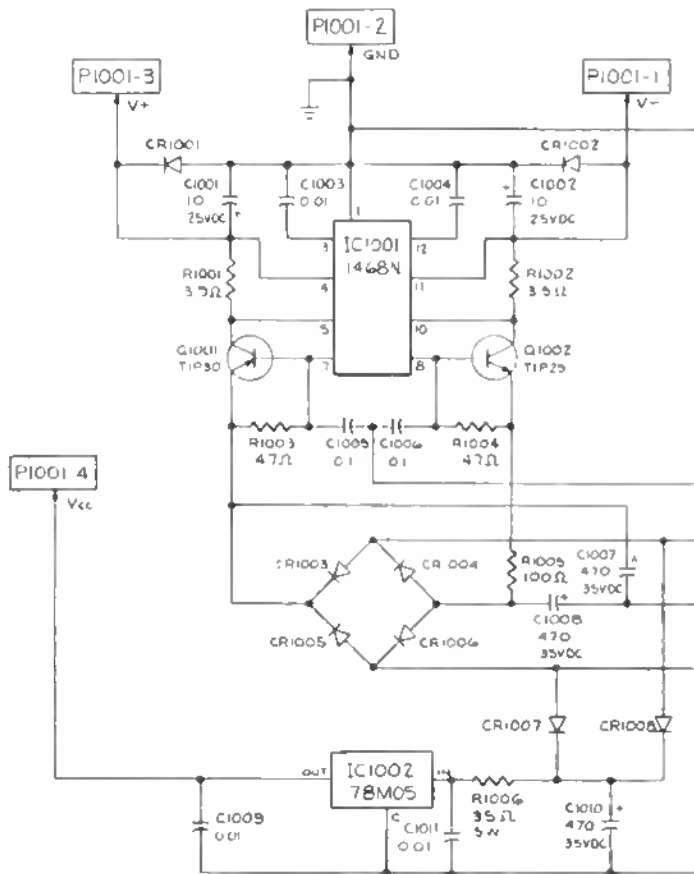
FIG 2.
BLOCK DIAGRAM



LAST			REF		DES.		USED			
R	C	IC	Q	CR	A	J	SW	S	P	
191	113	106	101	105	105	—	—	2	23-1,2,4, 5,7,13	
216	201	201	209	210	—	—	—	—	23-2,6,8	
314	308	—	302	—	301	301	—	—	23-2,8 24-1,3,6	
416	402	401	402	410	—	—	—	—	23-2,4,6	
532	503	503	513	—	501	—	—	—	23-1,3,5	
611	609	602	601	601	602	—	—	—	23-15	
721	709	706	701	701	702	—	—	—	23-10,12	
809	—	801	—	—	—	—	—	—	23-11,14,16	
931	909	910	909	907	—	—	908	—	23-1,2,4,5, 7,13,14	

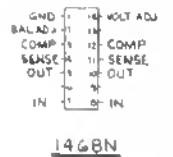
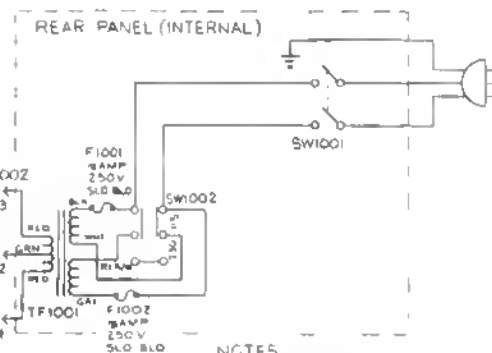
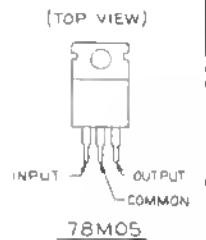
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REVISIONS				
SYM	DESCRIPTION	E.O.	DATE	APPROVED
A	ADDED C1011	WJA	0103	WJA



LAST REF DES USED									
R	C	CR	Q	IC	SW	P	F	TF	
1006	1010	1008	1002	1002	1002	1002	1002	1001	

V1 = +15VDC
V- = -15VDC
Vcc = +15VDC
GND



NOTES

- UNLESS OTHERWISE SPECIFIED -
1. ALL RESISTOR VALUES ARE IN OHMS & VA W.
2. ALL CAPACITOR VALUES ARE IN MFD
3. ALL DIODES ARE 1N4004

ITEM	PIST ALUM R	DESCRIPTION	MATERIAL
1	PIST ALUM R	DESCRIPTION	MATERIAL
2	PIST ALUM R	DESCRIPTION	MATERIAL
3	PIST ALUM R	DESCRIPTION	MATERIAL
4	PIST ALUM R	DESCRIPTION	MATERIAL
5	PIST ALUM R	DESCRIPTION	MATERIAL
6	PIST ALUM R	DESCRIPTION	MATERIAL
7	PIST ALUM R	DESCRIPTION	MATERIAL
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12	PIST ALUM R	DESCRIPTION	MATERIAL
13	PIST ALUM R	DESCRIPTION	MATERIAL
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